

REMARKS

Claims 1-15 are pending in the present application. Claims 1-15 are rejected under 35 U.S.C. 103(a). Claims 1 and 9 are amended. No new matter is added. The drawings and specification are also objected to. The objections and rejections are respectfully traversed in light of the following remarks, and reconsideration is requested.

Objections to Drawings

Figures 1A-1F are objected to for failing to designate "Prior Art" on these drawings. A replacement sheet for Figs. 1A-1F is included, which adds the legend "Prior Art" to Figs. 1A-1F, as well as the label "Replacement Sheet" in the page header.

Objections to Specification

The disclosure is objected to because element 304 has been identified as both a surface in paragraph [0133] and an active layer in paragraph [0138]. Paragraph [0138] has been amended to change "active layer 304" to "active layer 302", which is consistent with Fig. 2 and its corresponding description

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Rejections under 35 U.S.C. § 103(a)

Claims 1-15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura US Patent 6,211,041 in view of Sakaguchi et al. US Patent 6,313,014.

In rejecting claims 1 and 9, the Examiner writes, in part, that “Sakaguchi teaches in figures 1-11C, and corresponding text, a method for manufacturing a SOI substrate, pertaining to claims 1-3, and 9, using an annealing process, that utilizes radiation of a lamp for the purpose of Rapid Thermal Annealing (RTA) as an alternative to conventional heat treatment”.

As noted by the Examiner, Ogura fails to show forming an SOI structure with flashing the support substrate with radiation energy which impinges on a surface of the support substrate. Ogura simply discloses a conventional SOI manufacturing process, in which the substrate support and semiconductor substrate are heat treated or subjected to a heat treatment. Such heat treatments can last for about 10 minutes at 800°C to about 24 hours at about 300°C, as set forth in Applicant’s background section. These heat treatments cause stresses which can cause the SOI structure to break or shatter.

Sakaguchi is cited for remedying the deficiency of Ogura. Sakaguchi discloses using lamps for Rapid Thermal Annealing (RTA) to carry out hydrogen-annealing. (Sakaguchi, col. 8, lines 25-32). The RTA lamp is disclosed as an alternative to an ordinary vertical or horizontal type heat-treatment furnace. Because there is nothing to the contrary, it appears to Applicant that the RTA lamp is located on a top portion of a chamber and heats the substrate from above, as is conventional. Thus, Sakaguchi discloses that the heat for hydrogen-annealing either surrounds the substrate (such as in a furnace) or is directed to and incident on the uppermost layer of the substrate (such as from lamp(s) located above the substrate).

In contrast, claim 1 has been amended to recite “flashing said support substrate with radiation energy which is directional and impinges on the second surface of said

support substrate for a substantially instantaneous time to go through said support substrate toward the first surface and heat the first depth of said silicon substrate to an annealing temperature”, where the first surface is away from the bottom of the support substrate and adjacent the impurity layer. Support for the amendment is found in Applicant’s specification at Fig. 2D and corresponding text, and thus no new matter is added. Thus, the method of claim 1 provides for a directional flashing through the bottom of the device, i.e., from the bottom of the support substrate up to the impurity layer. As stated in Applicant’s specification at page 3, paragraph [0116],

Typical, heat treatments of SOI wafers have required heating of the entire bulk SOI wafer. The selective heating of primarily just the region defined by the implanted hydrogen ions of the silicon substrate allows for causing the agglomeration of the hydrogen implantation without creating stresses due to inconsistent thermal expansion coefficients of the substrate materials, thus avoiding causing the destruction of the SOI wafer.” (emphasis added).

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Therefore, because Ogura and Sakaguchi disclose manufacturing an SOI device by either heating the entire wafer (furnace) or from the uppermost layers of the wafer (RTA lamp) and not “flashing said support substrate with radiation energy which is directional and impinges on the second surface of said support substrate for a substantially instantaneous time to go through said support substrate toward the first surface and heat the first depth of said silicon substrate to an annealing temperature”, as recited in claim 1, claim 1 is patentable over Ogura in view of Sakaguchi.

Independent claim 9 has been amended to recite “flashing, directionally, an opposing second surface of said second substrate to heat said first depth to an annealing temperature”. Thus, for reasons similar to claim 1 above, claim 9 is patentable over Ogura in view of Sakaguchi.

Claims 2-8 and 10-15 depend on claims 1 and 9 and are thus patentable over Ogura in view of Sakaguchi for at least the same reasons as claims 1 and 9.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections of the claims under 35 U.S.C. § 103(a).

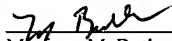
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CONCLUSION

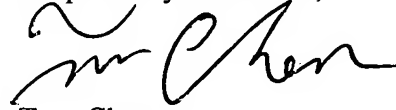
For the foregoing reasons, Applicant believes pending claims 1-15 are allowable, and a notice of allowance is respectfully requested. If the Examiner has any questions regarding the application, the Examiner is invited to call the undersigned Attorney at (949) 752-7040.

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to:
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Monique M. Butler

November 23, 2004
Date of Signature

Respectfully submitted,



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IN THE DRAWINGS

A Replacement Sheet for Figs. 1A to 1F is included in the response, which adds the legend "Prior Art" to each Fig. 1A to 1F.

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